

M.T., and this difference therefore becomes comparable with the numbers in the last column deduced from observation.

Though the tabular error of Bouvard's Tables appears to be increasing at the present time, we should hardly expect to find so great an increase as  $10''$  in the interval between December 1878 and December 1879, viewed in conjunction with the column of errors determined from observations made near  $6^h$ ; and may we not therefore assume that the large difference found between the two calculated places for 1880, January 1, is partly due to small outstanding errors in the new Tables?

*Blackheath,*  
1879, January 4.

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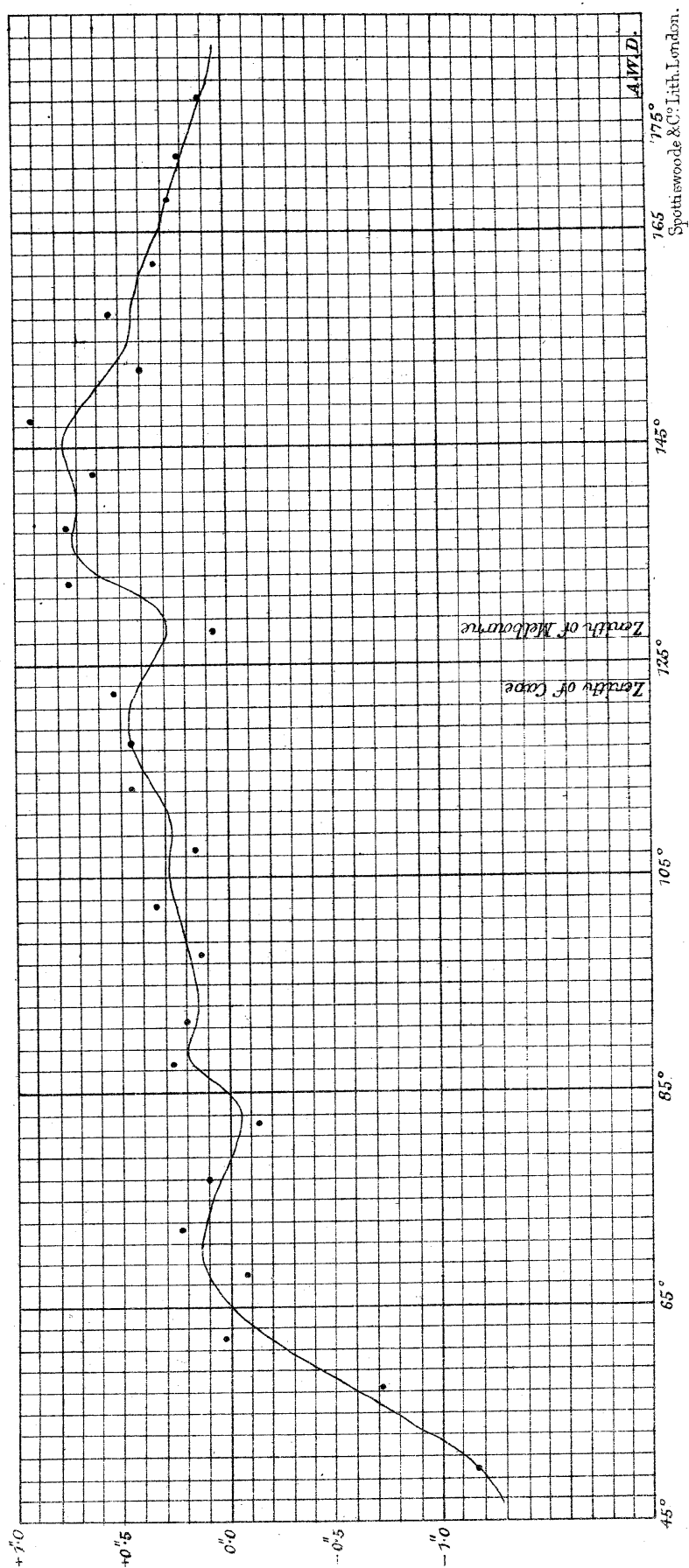
*On the Reduction of the North Polar Distances of the First Melbourne General Catalogue for 1870 to Auwers' Standard.*

By A. W. Downing, B.A. (Dublin).

This investigation consists essentially of a comparison of the North Polar Distances of the Cape Catalogue for 1860 with those of the Melbourne Catalogue. The reduction of the latter to the Standard is then accomplished by applying to the differences Cape—Melbourne for different N.P.D.'s the corrections applicable to the N.P.D.'s of the Cape Catalogue to reduce them to the Standard, which I have given in a former paper, printed in the *Monthly Notices* for December 1878.

There are 352 stars common to the Cape and Melbourne Catalogues which are available for the comparison, after rejecting those whose places in either Catalogue depend on a single observation. I have also rejected  *$\alpha$  Centauri* and another star which gave a discordant result. As the southern stars have generally been reduced to the mean epochs of the Catalogues with different proper motions in each Catalogue, it has been necessary to correct the places given in one of the Catalogues for the difference, and the proper motion given in the Cape Catalogue has been adopted as the one to be used, except in those cases in which this proper motion is taken from the B.A.C., when the value given in the Melbourne Catalogue has been used in preference. The places in the Cape Catalogue have then been brought up to 1870, with the precessions given in this Catalogue and the adopted proper motion, and the difference taken between the N.P.D. thus obtained and that given in the Melbourne Catalogue, corrected, if necessary, for assumed proper motion. The 352 stars, having been arranged in order of N.P.D., have been taken in groups, each group embracing about  $5^\circ$ , and the means taken of the N.P.D.'s and of the differences between the Catalogues for each group. These mean differences have been

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AND  
MELBOURNE CATALOGUES.



laid down and a curve (see diagram) drawn through the points, which may be taken as representing the systematic differences between the Catalogues.

The following Table gives the differences as computed and as read off from the curve:—

N.P.D.		Number of Stars.	C-M.	
°	'		Computed. "	Curve. "
49	51	4	-1.17	-1.17
57	13	3	-0.71	-0.59
62	10	10	+0.03	-0.20
67	56	9	-0.08	+0.09
72	14	7	+0.22	+0.12
77	5	12	+0.10	+0.04
82	23	14	-0.12	-0.06
87	20	11	+0.28	+0.16
91	47	10	+0.20	+0.16
97	52	8	+0.12	+0.18
102	39	5	+0.34	+0.25
107	22	9	+0.16	+0.26
113	3	7	+0.46	+0.34
117	37	20	+0.45	+0.45
122	24	12	+0.53	+0.44
127	45	20	+0.07	+0.28
132	25	30	+0.74	+0.53
137	18	25	+0.77	+0.71
142	46	14	+0.62	+0.73
147	36	20	+0.92	+0.72
152	27	21	+0.40	+0.52
157	19	28	+0.53	+0.44
162	19	6	+0.32	+0.37
168	9	14	+0.27	+0.27
172	15	20	+0.21	+0.19
177	13	13	+0.12	+0.11

The differences have then been read off from the curve for every 4°, and the correction to the Cape N.P.D. to reduce it to the Standard (or to Henderson, for stars south of N.P.D. 120°) applied. The result is given in the two following Tables:—

# COMPARISON OF THE NORTH POLAR DISTANCES, OF THE CAPE AND MELBOURNE CATALOGUES.

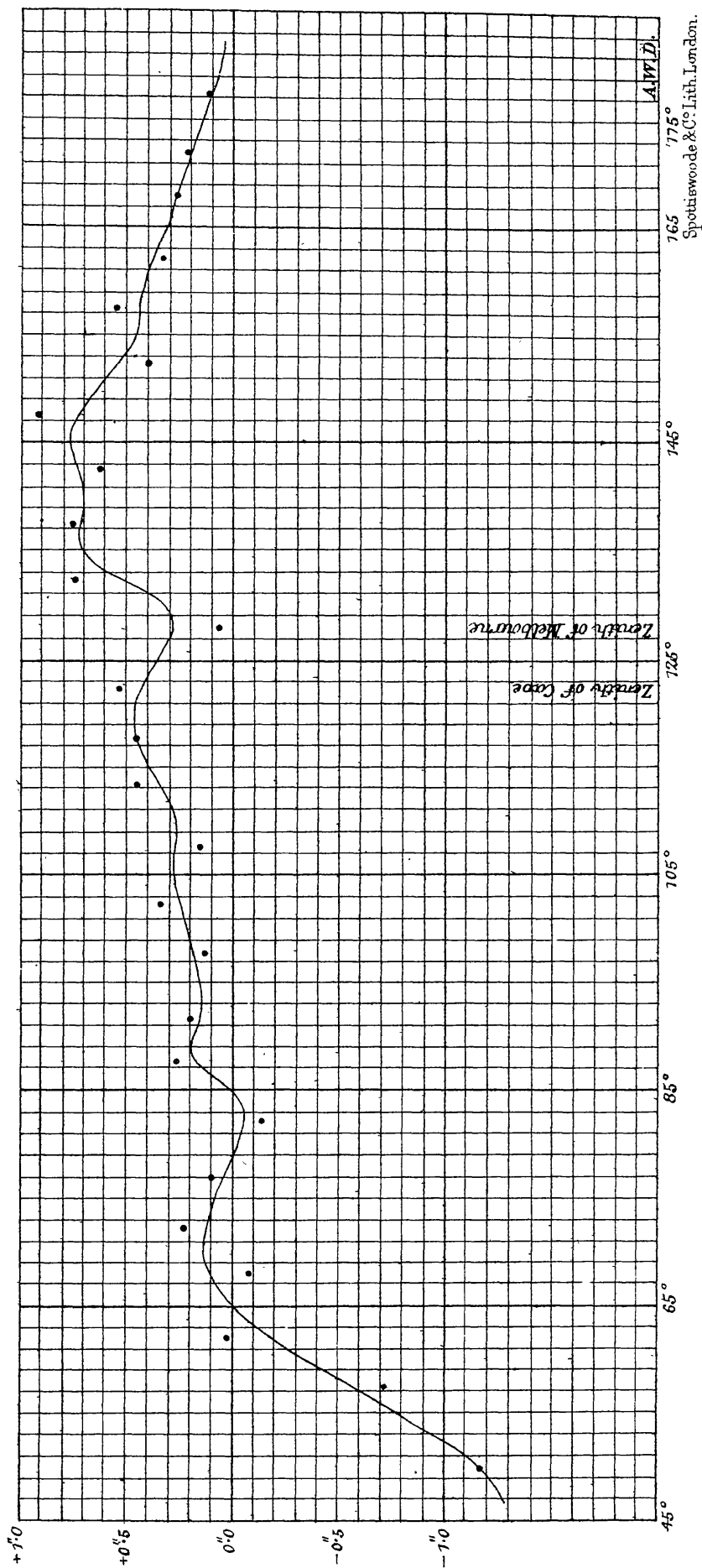


TABLE I.—*Reduction to Auwers' Standard.*

N.P.D. °	C-M. "	Standard-M. "	N.P.D. °	C-M. "	Standard-M. "
48	-1'25	-0'87	88	+0'17	+0'29
52	-1'05	-0'78	92	+0'14	+0'33
56	-0'70	-0'55	96	+0'17	+0'42
60	-0'35	-0'22	100	+0'22	+0'44
64	-0'05	+0'03	104	+0'27	+0'35
68	+0'10	+0'12	108	+0'26	+0'20
72	+0'12	+0'10	112	+0'30	+0'09
76	+0'06	-0'02	116	+0'43	+0'27
80	-0'03	-0'09	120	+0'46	+0'21
84	-0'04	-0'02	124	+0'37	+1'97

TABLE II.—*Reduction to Henderson.*

N.P.D. °	C-M. "	H-M. "	N.P.D. °	C-M. "	H-M. "
120	+0'46	+1'70	152	+0'55	+0'11
124	+0'37	+1'54	156	+0'44	-0'02
128	+0'28	+1'24	160	+0'41	+0'09
132	+0'47	+1'00	164	+0'34	-0'02
136	+0'72	+0'83	168	+0'27	-0'20
140	+0'70	+0'55	172	+0'19	-0'24
144	+0'76	+0'71	176	+0'12	-0'18
148	+0'69	+0'51	180	+0'06	-0'02

This reduction to Henderson is of course provisional only. I hope that, when Mr. Stone's great Catalogue is published, it will be possible to deduce a system of Standard North Polar Distances for Southern Stars analogous to that given by Dr. Auwers for stars visible in European latitudes.

Greenwich,  
1879, Jan. 7.